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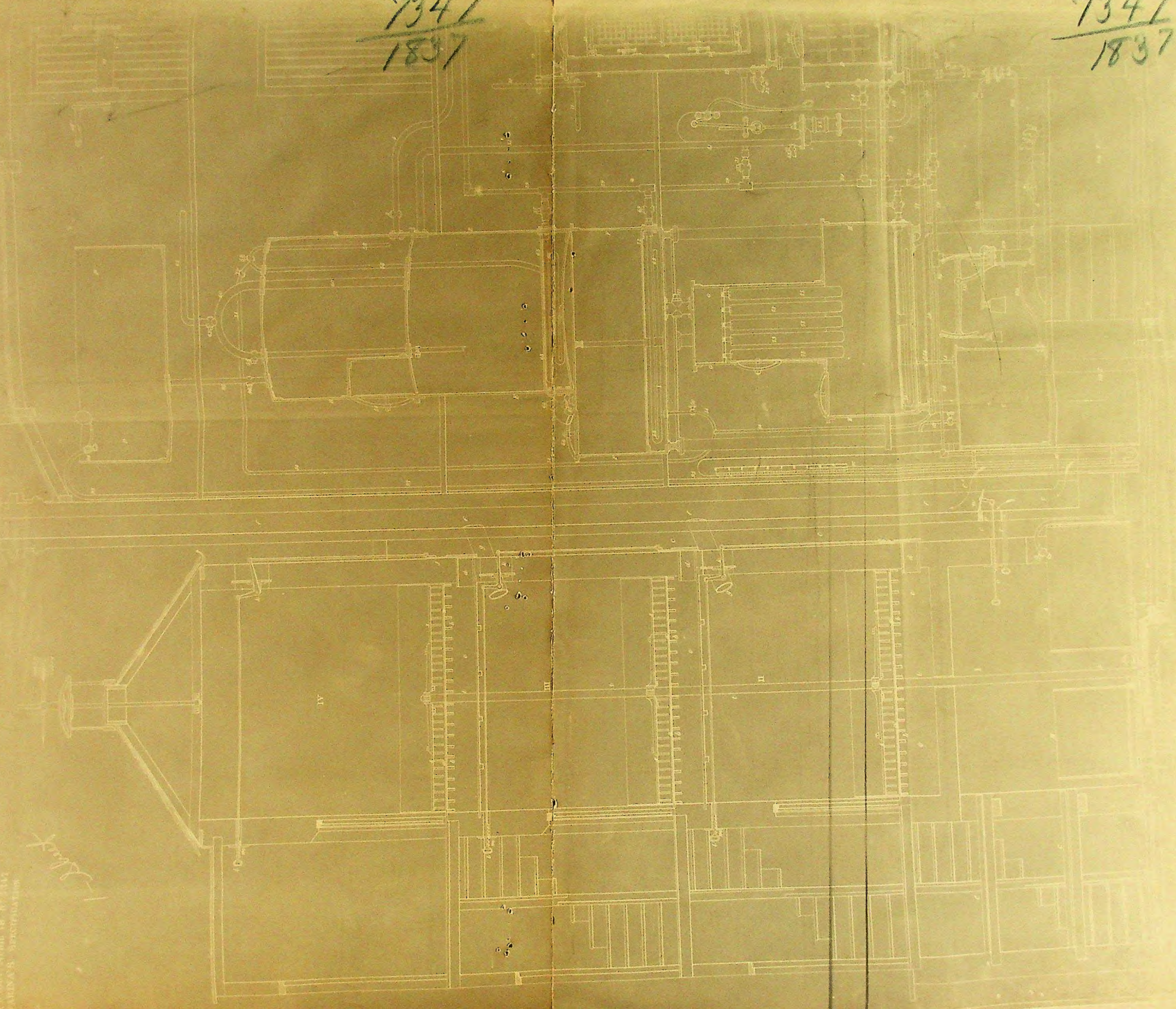




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PLAN OF THE BUILDING  
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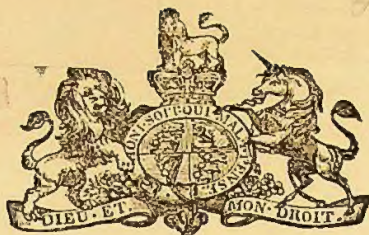
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A.D. 1837 . . . . . N° 7347.

### Obtaining Fermentable Matter from Grain, &c.

#### FARINA'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, CHARLES FARINA, of Clarendon Place, Maida Vale, in the County of Middlesex, Gentleman, send greeting.

WHEREAS His late most Excellent Majesty, King William the Fourth, 5 by His Letters Patent, under the Great Seal of Great Britain, bearing date at Westminster the Eighteenth day of April, in the seventh year of His reign, did, for Himself, His heirs and successors, give and grant unto me, the said Charles Farina, His especial licence, that I, the said Charles Farina, my exors, admors, and assigns, or such others as I, the said Charles Farina, 10 my exors, admors, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein expressed, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, my Invention of "**AN IMPROVED PROCESS TO BE USED IN OBTAINING FERMENTABLE MATTER FROM GRAIN AND IN** 15 **MANUFACTURING THE SAME FOR VARIOUS PURPOSES,**" in which said Letters Patent is contained a proviso obliging me, the said Charles Farina, by an instrument in writing, under my hand and seal, particularly to describe and ascertain the nature of my said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled in His said Majesty's High 20 Court of Chancery within six calendar months next and immediately after the date of the said recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that in compliance with the said proviso, I, the said Charles Farina, do hereby declare the nature of my said Invention to consist



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in an improved process, commencing with the malting and continuing to the mashing of grain in air-tight vessels, whereby I am enabled to obtain a greater quantity of fermentable matter than by any process or processes now in use, and further continuing, through various air-tight, heating, filtering, and cooling apparatuses, for the purpose of manufacturing the said fermentable matter 5 into beer, ale, porter, and the like malt liquors; and in further compliance with the said proviso, I, the said Charles Farina, do hereby describe the manner in which my said Invention is to be performed, by the following statement thereof, reference being had to the Drawing annexed, and to the letters marked thereon, that is to say:—

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## DESCRIPTION OF THE DRAWING.

The Drawing represents a vertical section of a malting, mashing, and brewing apparatus, shewing in section all the principal vessels required for my said improved process, and for the manufacturing the fermentable matter obtained thereby into beer. The malt kiln here represented to the left side of the 15 Drawing is of a circular form, and consists, as here represented, of four stories of floors, marked I., II., III., IV. In the lowest floor I., are placed the steeping cistern A, guage couch B, and growing floors C; these floors are of composition supported on wood as usual; the improvement being in having the floors under the surface of the ground, the natural situation for the growing 20 of grain. In the other stories II., III., IV., are floors *a* of perforated sheet-iron or wove wire laid upon bars of iron *b* in the usual manner. On these floors the grain is spread. The drying is effected on the several floors by the heat from a furnace supposed to be set in the brickwork 108 at X, the flue from which communicates with the vent *c*, which I call the hot vent. The 25 hot air passes by the passages *d* into the chambers *e* under the several floors *a*. The heat being equally diffused in these chambers *e*, rises through the floors and grain, and passes along with the smoke and steam from the grain into the cold vent *f* by the pipes *g*. The desired degree of heat for the several floors of the kiln is regulated by the dampers *j*, which are worked by the cranks *k* 30 and handles *l*, and fixed by the notched rack rods *m*. Hence, it is plain, that by adjusting these dampers, the same degree of heat, or any required degree, may be obtained from the hot vent *c* to the several floors of the kiln, and that by opening and shutting the dampers, any one of the floors may be heated separately, or any two or more of them at once. The heat from the furnace in the 35 brickwork at X may be all conveyed into the hot vent *c*, by keeping the damper *m* in the position represented, which is done by the rack rod *o*, or by lowering the damper *n*, the passage *p* into the hot vent *c* will be shut, and a



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passage into the cold vent *f* will be opened, by which the heat to the kiln may be regulated or entirely shut off. The kiln may be cooled or ventilated by opening the damper *r*. The smoke from the furnace under the boiler *S* at 108 passes into the cold vent *f* at *f*\*.

- 5 The stirring or turning of the malt while drying is effected by the revolution of the oars *s* fixed to the vertical axle *t*, which is turned by the bevel wheels *u*, *v*, horizontal axle *w*, fixed pulley *x*, endless strap *y*, and the fixed pully *z*. The revolving shaft 17 of the steam engine 15, a loose pully by the side of pully *z*, is used for throwing the strap *y* out of gear. On the top
- 10 of the kiln is erected a turning ventilator for the upper story in the usual manner. The malting of the grain so as to make pale malt being completed here, it is removed to the upper story of the contiguous building, where, after having been matured by keeping the proper time, it is placed as required into the hopper 101 of the ordinary grinding mill 100, where it is ground as
- 15 fine as possible, and then put into the hopper *I* above the mash tun *A*. *A* is my improved mash tun made perfectly air-tight, and surrounded by a warm air or steam jacket. The mash tun *A* having been charged with hot water from the hot water back *B*, by the cock 3 and pipe 4, and with the finely ground malt by the hopper 1 and pipe 2, the mashing is effected by the
- 20 horizontal revolution of the mashing oars fixed to the frame 5, which frame is hinged to the upright axle 8, which passes through the stuffing box 9, and is propelled round either by the wheel 10 and crank handle 11, axle 12, and bevel wheels 13, 14, or by the steam engine 15, by means of the pulley 16, fixed on the revolving shaft 17 of the steam engine, and an endless strap 18,
- 25 which communicates the motion to a pulley 19 fixed on the axle 20, and bevel wheel 21. The loose pulley 22 is for throwing the strap 18 out of gear. Either manner of propelling the mashing oars being adopted, the other must be thrown out of gear by the ordinary means of withdrawing the axles 12 or 20 in their bearings. On the upright axle 8 are fixed bevel wheels 6, which
- 30 turn the vertical mashing oars reverse motions, and the horizontal motion of the frame 5 is effected by the fixed cog wheels 23, working in cogs 24, fixed round the inside of the tun. The mash tun *A* is made steam-tight with a man hole 25, and safety valve 26, and is enclosed by the steam case or jacket 27, which is supplied with steam from the steam boiler by *S* the pipe 29, and
- 35 cocks 30, 31. This steam jacket has a safety valve 32, and the condensed steam is drawn off from it by the cock 32<sup>a</sup>, or partly by the overflow cocks 33, and conveyed back to the water tank *c* by the pipe 34. The mashing is thus kept quite close, and in any degree of temperature. The wort is drawn off from the mash tun into the under back *D* by the pipe 35, and slide valve 36



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opened and shut by the rack and pinion 37, worked by the crank handle 38. The mash tun has a loose perforated under cover 39, for equalizing the sparging with hot water, and the wort is drained from the grains in passing through the loose perforated bottom 40 of the mash tun. The perforated bottom has also a valve 49 opened by means of a rod furnished with a hook, 5 and applied through the man-hole 25, to allow the grains to fall through to the lower chamber, and thence through the slide valve 36 by the pipe 35 into the under back D, from which they are removed in the usual manner. The under back D is also steam-tight, with a man-hole 41, and a safety valve 42, and incloses by the steam case a jacket 43, with its safety valve 45, supplied with steam from the steam boiler S by the pipe 29, and its cock 44, and the condensed steam withdrawn and conveyed back to the water tank C, by the branch pipe 34, and its cock 46. The wort in the under back D is also heated by the worm pipe 47, supplied with steam by the pipe 29, and regulated by the cock 48, and the condensed steam withdrawn and conveyed to 15 the water-tank C, by the branch pipe 34, and its cock 46. The worts in the under back are thus kept quite close and in any desired degree of temperature. The under back D is also fitted up with mashing oars for stirring the wort, which are propelled in the same manner as those already described in the mash tun by means of the spur gear here shewn for that purpose. The 20 wort thus obtained in the under back D from the grain is in fact the fermentable matter alluded to in the title to my said Invention, and the continuation of my said improved process, which I am now about to describe, is for the purpose of manufacturing the said fermentable matter into what is usually termed beer. To proceed then with process for the purpose of manufacturing 25 the fermentable matter thus obtained into beer, the wort in the under back D having been further cleared from the grains, by passing through the loose perforated bottom 50 of the under back, is conveyed to the copper E by the copper-colored pipe 51 and force pump 52. The pipe 51 is emptied of the worts when necessary by the cock 53. The copper E is also made steam- 30 tight with a man-hole 54, by which the hops are put into the copper and taken out again after having been used. The copper having been charged with the wort as described, by means of the force pump, and the hops put in, the boiling is effected by the worm pipe 56, which is supplied with steam from the steam boiler S by the pipe 29, and regulated by the cock 57. The 35 condensed steam from the worm pipe 56 is either conveyed to the hot-water back B by the pipe 58, regulated by the cock 59, or to the water tank C by the pipe 34. The steam or vapour arising from the boiling in the copper having been condensed in passing through the pipe 60, is conveyed back into



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the copper by the cocks 55, 61, or conveyed into any other vessel by the pipe 62 and cock 63. The wort having been boiled with the hops is drawn off into the under or jack back F, by the cock 64 having been drained from the hops in passing through the loose perforated bottom 65 of the copper. The  
5 jack back F is also made steam-tight, with a man-hole 66, and safety valve 67. The wort in the jack back is kept in any desired degree of temperature by the worm pipe 68, supplied with steam from the steam pipe 29, regulated by the cock 69, and the condensed steam conveyed to the water tank C by the pipe 34, and regulated by the cock 70. The wort  
10 having been further drained from the hops in passing through the loose perforated bottom 72 of the jack back F, it is drawn off by the cock 71, to a box G, from which it passes through the filter bags 73 into the wort back H. The wort back H is also made steam-tight, with a man-hole and safety valve, and is kept in any desired degree of temperature by the worm pipe 74, supplied  
15 with steam from the steam pipe 29, and regulated by the cock 75, the condensed steam being conveyed to the water-tank C by the pipe 34 and cock 76. The wort is now conveyed from the wort back H up to the wort-receiving tank I by the pipe 77, and force pump 78. The wort-receiving tank I is provided with a close cover. From thence the worts are conveyed to the  
20 refrigerator K by the pipe 79, regulated by the cock 80. The wort falling into the top of the refrigerator K passes through the perforated cover 81 into the several vertical tubes 82, which are inclosed in a close vessel of cold water, and which I call the refrigerator K. From these tubes 82 the wort falls into the under part of the refrigerator 83, and is drawn off by the pipe 84 leading  
25 from a horizontal refrigerator L, which is merely a serpentine pipe placed in cold water, and from which the wort falls into the cold wort receiving back M, also fitted with a close cover, and regulated by the cock 85. The wort having been charged with yeast in the receiving back M in the usual manner, is drawn down to the ordinary squares N by the pipe 86, regulated by the  
30 cock 87, where, undergoing fermentation, the pure malt liquor is drawn off by the pipe 88 and cock 89 to the casks below 90. The refrigerators K and L are both close vessels, through which a continuous stream of cold water is passed, first pumped from a cold well below by the pipe 91 and force pump 92, which is wrought by a crank on the end of the  
35 revolving shaft 17 of the steam engine. The water is thus thrown up into a cold water tank O, from which it falls by the pipe 93 to the upright and horizontal refrigerators at their bottoms, and rising to the top of the upright refrigerator, passes away by the pipe 92 to the outside of the brewery; or by shutting the cocks *a*, *b*, and opening the cocks *c*, *d*, the water



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may first pass through the horizontal refrigerator L, and then by the pipe *e* to the upright refrigerator K, and pass away by the pipe 92. The cold water tank B is supposed to be supplied from an ordinary main water pipe in the street by the pipe 93, furnished with a ball cock 94, or it might be so placed as to be fed from the pipe 92. The hot water back B is supplied from the 5 cold water tank P by the pipe 95 and cock 96. The pressure of steam per square inch of the boiler S is ascertained by the mercurial guage 97 connected to the steam boiler S by the pipe 98. The malt is hoisted to the upper loft by the windlass 99, and conveyed to the mill 100 by the hopper 101, and from the mill to the loft below by the tube 102. The mill is propelled by the 10 steam engine by means of the fixed pullies 103, 104, and the strap 105, provided with a loose pulley on the revolving shaft 17, of the steam engine. The steam boiler S is fed with water from the tank C by the pipe 106, by means of the force pump 107, which is worked by a short crank on the end of the revolving shaft 17 of the steam engine. 112 is the fly wheel of the 15 steam engine; 108 is the brickwork containing at X the furnace for drying the malt, and at Y the furnace for heating the steam boiler. 109 is a safety valve; 110 a guage to ascertain the water in the steam boiler; 111 a pipe to supply the water tank C.

Having now described the improved process by which I manufacture the 20 fermentable matter obtained in manner described in the first part of my Specification into that kind of malt liquor commonly called "beer," it is only necessary to state that by mixing the usual portion of brown and black malt with the pale malt, the same process will produce porter; and it may be here stated that brown and black malt may be made in the kiln herein- 25 before described, as well as pale malt, dependant only on the heat applied.

Now whereas it is evident that many parts of my said improved process are applicable also to the manufacture of spirits, vinegar, and such other articles as require the previous production of fermentable matter, and I claim the same so far as they are so applicable, as aforesaid. 30

And whereas I also claim as my Invention, first, as regards malting, placing the grain on the underground growing floors, and then on the other floors, one over the other, as here shewn and introduced, and regulated the heat under them, and stirring the grain upon them in manner herein-before described for malting purposes, whereby a great economy of heat, labour, and 35 time is effected, and a great consequent saving of capital.

Secondly, as regards extracting fermentable matter, mashing grain ground exceedingly fine (that is, as fine as it can be ground in an ordinary malt mill) in a steam-tight mash tun and under back, and applying heat all round them



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the while by means of their respective outer jackets, and when sufficiently mashed discharging the whole contents of the mash tun, grains and all, at once into the under back.

Thirdly, as regards manufacturing the said fermentable matter, when  
5 obtained, into beer, ale, porter, and other the like liquors, working it generally through its various processes in air-tight apparatuses, and arranged as herein-before described, whereby I am enabled to brew malt liquor without any exposure of the worts to the external atmospheric air.

Fourthly, filtering the worts after boiling with the hops, in manner herein-  
10 before described, and condensing the steam of the boiling worts, and returning it into the boiler, in manner also herein-before described.

And such my Invention being to the best of my knowledge and belief entirely new, and never before used within that part of His said late Majesty's United Kingdom of Great Britain and Ireland called England, His late  
15 Dominion of Wales, or Town of Berwick-upon-Tweed, I do hereby declare this to be my Specification of the same, and that I do verily believe this my said Specification doth comply in all respects fully and without reserve or disguise with the proviso in the said herein-before in part recited Letters Patent contained, wherefore I do hereby claim to maintain exclusive right and  
20 privilege to my said Invention.

In witness whereof, I, the said Charles Farina, have hereunto set my hand and seal, this Eighteenth day of October, in the year of our Lord One thousand eight hundred and thirty-seven.

CHARLES (L.S.) FARINA.

25 AND BE IT REMEMBERED, that on the Eighteenth day of October, in the year of our Lord 1837, the aforesaid Charles Farina came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified in form above written. And also the Specification aforesaid was stamped according to the  
30 tenor of the Statute made for that purpose.

Inrolled the Eighteenth day of October, in the year of our Lord One thousand eight hundred and thirty-seven.

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